Claims

1. A method of coupling a disulfide bridge containing protein or peptide to a carrier comprising the following steps,
   a) irradiating the protein or peptide to create a thiol group in the protein or peptide by disulfide bridge disruption, and
   b) incubating the irradiated protein or peptide with a carrier capable of binding a thiol group and thereby obtaining a coupling,
   or
   a) incubating the protein or peptide with a carrier capable of binding a thiol group, and
   b) irradiating the protein or peptide in the presence of said carrier to create a thiol group in the protein or peptide by disulfide bridge disruption and thereby obtaining a coupling.

2. A method according to claim 1, wherein said irradiation step comprises light of a wavelength that excites one or more aromatic amino acids.

3. A method according to claim 2, wherein said aromatic amino acids comprise tryptophan, tyrosine and phenylalanine.

4. A method according to claims 2 or 3, wherein said irradiation comprises light with a wavelength of about 295nm, 275nm or 254nm.

5. A method according to claim 3, wherein said aromatic amino acid is tryptophan.

6. A method according to any one of claims 2, 3 or 5, wherein the wavelength is about 295nm.

7. A method according to any one of claims 1 to 6, wherein said protein or peptide is irradiated in the presence of a free aromatic amino acid.

8. A method according to any one of claims 1 to 7, wherein said carrier comprises a peptide, a protein or a biomolecule.

9. A method according to any one of claims 1 to 7, wherein said carrier is a support.

10. A method according to claim 8, wherein said coupling is an immobilization on said support.

11. A method according to claim 10, wherein said immobilization is spatially controlled.

12. A method according to claim 10, wherein said support comprises gold.

13. A method according to claim 10, wherein said support is a derivatised support that is capable of binding a thiol group.

14. A method according to claim 10, wherein said support comprises a thiol group or a disulfide bridge.

15. A method according to claim 14, wherein the support comprises a spacer.

16. A carrier comprising one or more proteins or peptides coupled by the method of any one of claims 1 to 15.

17. A carrier according to claim 16, wherein the carrier is a support.

18. A carrier according to claim 17, wherein the support is selected from the group consisting of an electronic chip, slide, wafer, resin, well, tube, microarray and membrane.

19. A carrier according to claim 18, wherein the support comprises a material selected from the group consisting of topaz, polystyrene, polyethylene, polyester, polyethermide, polypropylene, polycarbonate, polysulfone, polymethylmethacrylate, poly(vinylidene fluoride), silicone, diamond, quartz and silica, silicium, metal, nylon, nitrocellulose, agarose, cellulose and ceramic.

20. A carrier according to any of claims 16 to 19, wherein the one or more proteins or peptides are selected from the group consisting of an enzyme, transcription factor, protein domain, binding protein, antigen and immunoglobulin.

21. A carrier according to claim 20, wherein said immunoglobulin is a F(ab) fragment.

22. A carrier according to claim 20, wherein said enzyme is selected from the group consisting of cutinase, chymosin, glucose oxidase, lipase, lysozyme, alkaline phosphatase and plasminogen,

23. A carrier according to claim 16, wherein the carrier comprises a pharmaceutical drug.

24. Use of a carrier according to any one of claims 16 to 22 for a bio-functional reaction.

25. Use of a carrier according to claim 24, wherein said bio-functional reaction are selected from the group consisting of a bio-sensor, chromatography, immunodetection, enzyme assay, nucleotide binding detection, protein-protein interaction, protein modification, carrier targeting and protein targeting.

26. Use of the method according to any one of claims 1 to 15 for the production of a bio-sensor or a protein/peptide microarray.

27. Use of a carrier according any of claims 16 to 23 for use in a diagnosic or biosensor kit.

28. A method of predicting a disulfide bridge containing protein or peptide capable of disruption by irradiation comprising the steps of:

a) identifying and selecting a disulfide bridge containing protein or peptide, and

b) identifying and selecting a protein or peptide selected in (a), further comprising an aromatic amino acid residue within 10Å of said disulfide bridge, and

c) identifying and selecting a protein or peptide selected in (b), wherein the plane of the dipole of the side-chain of said aromatic amino acid is not orthogonal to the plane of said disulfide bridge.

29. A method according to claim 28, further comprising the step of: identifying and selecting a protein or peptide selected in (b) or (c), wherein the amino acid residues located within an 8Å radius of the indole ring of said aromatic amino acid residue are over-represented by amidic amino acid residues (Asn, Gln), as well as, short aliphatic amino acid residues (Gly, Ala, Val) and /or long aliphatic amino acid residues (Leu, Ile) by at least 1 fold, and under-represented by

charged amino acids (His, Lys, Arg)(Asp, Glu) and proline residues by at least 1 fold.